

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Eric Thomas Gohr et al.)	
)	Group Art Unit: 1714
Serial No.:	10/740,074)	
)	
Filed:	December 17, 2003)	Examiner: Szekely, Peter A.
)	
For:	METHOD FOR REDUCING HAZE)	
	IN A FIRE RESISTANT)	
	POLYCARBONATE COMPOSITION)	

Commissioner for Patents
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APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the General Electric Company.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 1 - 29 are pending in the application. Of these, Claims 10 - 20 are allowed. Claims 1 - 9 and 21 - 29 stand finally rejected. Claims 1 - 29, as they currently stand, are set forth in Appendix A. Appellants hereby appeal the final rejection of Claims 1 - 9 and 21 - 29.

IV. STATUS OF THE AMENDMENTS

No amendments have been filed subsequent to the rejection dated November 21, 2005. All prior amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Polycarbonates are used in a variety of applications from buildings, car exteriors, aircraft interiors, or the like. The use of polycarbonates instead of metals decreases weight, improves sound dampening, and makes manufacturing and assembly of devices easier. Unfortunately, polycarbonates are inherently flammable, and thus use flame retardant additives to prepare a flame-retardant polycarbonate composition. The challenge is to identify economical, environmentally friendly flame retardant additives that provide the requisite flame resistance, but without compromising desirable polycarbonate properties such as strength and clarity.

Polycarbonates have generally been rendered flame retardant by using halogen based flame retardants that contain bromine or chlorine. However, these flame retardants are environmentally unfriendly and generally cannot be used in applications where environmentally friendly products are desired.

Flame resistance in polycarbonate compositions may also be achieved using a sulfonic acid salt such as potassium perfluorobutane sulfonate (KPFBS). While flame resistant, transparent polycarbonate compositions may be produced using KPFBS, optimum flame resistance is found for levels of salt that can result in haze, especially for thicker samples. The amount of flame retardant that can be added when an optically clear product is desired is thus limited. It is therefore desirable to develop methods where the haze and optical transparency of a flame retardant polycarbonate composition can be controlled. In particular, it is desirable to develop flame retardant polycarbonate compositions where the percent haze is about 0.51 to about 1.23.

It has surprisingly been found that highly flame resistant and transparent polycarbonate compositions may be obtained by blending KPFBS with a first polycarbonate to produce a concentrate, then blending the concentrate with a second polycarbonate to form a transparent, fire resistant polycarbonate composition. The use of KPFBS in a concentrate and a flame retardant composition has already been allowed to the Applicants and is now Patent No. 6,730,720.

In the practice of the process, the KPFBS is blended with a first polycarbonate to form a concentrate that is an intimate blend. The concentrate is further blended with a second polycarbonate to produce a final intimate blend. Such conditions resulting in an intimate blend often include mixing in single or twin-screw type extruders or similar mixing devices that can apply shear to the components. It is often advantageous to apply a vacuum to the melt through at least one or more vent ports in the extruder to remove volatile impurities in the composition.

In a preferred embodiment, the concentrate is pelletized. The first polycarbonate and flame retardant salt blend is extruded in molten form through a strand die to a water bath and pelletizer. The pelletized concentrate is then further blended with a second polycarbonate. The first polycarbonate can be the same as the second polycarbonate.

Not wishing to be bound by any theory, it is believed that the present method of using the KPFBS-polycarbonate concentrate aids in completely dissolving the KPFBS salt into the final polycarbonate composition by giving the KPFBS crystals an additional heat history. The additional heat history may allow for effectively solubilizing greater amounts of salt into the matrix. The present method allows for the use of higher levels of

flame retardant salt, thereby providing robust flame performance while at the same time maintaining polymer transparency.

While the use of KPFBS in a concentrate and a flame retardant composition has already been allowed to the Applicants and is now Patent No. 6,730,720, the Examiner has contended that other salts from the same family as KPFBS will not produce this same flame retardant effect. The Examiner contends this based on the fact that U.S. Patent No 6,353,046 to Rosenquist et al. has stated that another salt namely potassium diphenylsulfone-3-sulphonate (KSS) did not work as a flame retardant. In this Appeal, the Applicants contend that KSS belongs to a different family of flame retardant salts from KPFBS and that the other salts belonging to the same family as KPFBS can be used in concentrates to produce flame-retardant polycarbonates according to the claimed invention. Declaration A and B (affixed hereto as Appendix B and C respectively) contain data obtained with KPFBS (and were used to obtain Patent No. 6,730,720) and are hereby being submitted as evidence that other salts from the same family as KPFBS will function as flame retardants in polycarbonate when manufactured by the method claimed in the present application.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of potassium perfluoromethylbutane sulphonate, potassium perfluoromethane sulphonate, potassium perfluoroethane sulphonate, potassium perfluoropropane sulphonate, potassium perfluorohexane sulphonate, potassium perfluoroheptane sulphonate, potassium perfluorooctane sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts; pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Support for the polycarbonate composition in this claim can be found on page 2, paragraph [0005]. Support for the flame retardant salts in this claim can be found on page 3, paragraph [0007], while support for the cyclic siloxane can be found on page 7

and 8, paragraph [0016]. Support for the method of the claim can be found on page 8, paragraphs [0017] and [0018].

Independent Claim 10 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt comprises a C₁-C₆ alkylammonium salt; pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Support for the C₁-C₆ alkylammonium salt can be found on page 3, paragraph [0007], while support for the cyclic siloxane can be found on page 7 and 8, paragraph [0016]. As noted above, support for the method of the claim can be found on page 8, paragraphs [0017] and [0018].

Independent Claim 21 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of sodium perfluoromethylbutane sulphonate, sodium perfluoromethane sulphonate, sodium perfluoroethane sulphonate, sodium perfluoropropane sulphonate, sodium perfluorohexane sulphonate, sodium perfluoroheptane sulphonate, sodium perfluorooctane sulphonate, sodium perfluorobutane sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts; pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Support for the polycarbonate composition in this claim can be found on page 2, paragraph [0005]. Support for the flame retardant salts in this claim can be found on page 3, paragraph [0007], while support for the cyclic siloxane can be found on page 7 and 8, paragraph [0016]. Support for the method of the claim can be found on page 8, paragraphs [0017] and [0018].

Independent claim 22 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, pelletizing the concentrate; and blending the

pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition; wherein a 4.5 mm thick chip formed from the fire resistant polycarbonate has a percent haze of 0.51 to 1.23.

Support for the method of Claim 22 can be found on page 8, paragraphs [0017] and [0018], while support for the thickness of the sample can be found on page 11, paragraph [0029]. Support for the percent haze can be found on page 12, paragraph [0033].

Independent Claim 23 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of potassium diphenylsulphone sulphonate, sodium diphenylsulphone sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts; pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Support for the polycarbonate composition in this claim can be found on page 2, paragraph [0005]. Support for the flame retardant salts in this claim can be found on page 3, paragraph [0007], while support for the cyclic siloxane can be found on page 7 and 8, paragraph [0016]. Support for the method of the claim can be found on page 8, paragraphs [0017] and [0018].

Independent Claim 24 is directed to a method for reducing haze in fire resistant polycarbonate compositions, comprising blending a flame retardant salt with a first polycarbonate to form a concentrate; and blending the concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Support for the method of Claim 24 can be found on page 8, paragraphs [0017] and [0018].

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 – 9 and 21- 29 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Patent No. 5,449,710 to Umeda et al., (Umeda) in view of U.S. Patent No 6,353,046 to Rosenquist et al. (Rosenquist) or U.S. Patent No. 4,130,530 to Mark et al. (Mark), further in view of U.S. Patent No. 5,663,280 to Ogoe et al. (Ogoe '280) or U.S. Patent No. 5,041,479 to Ogoe (Ogoe '479). (Office Action dated 11/21/2005 page 2)

VIII. ARGUMENT

Claims 1 – 9 and 21- 29 are patentable under 35 U.S.C. § 103(a) over Umeda in view of Rosenquist or Mark, further in view of Ogoe '280 or Ogoe '479.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

In making the rejection, the Examiner has stated that

[i]t would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use siloxanes in the secondary references in the composition of Umeda et al. in order to reduce the melt viscosity and to masterbatch the resulting compositions for better dispersion of the flame retardant salts.

(Office Action dated 11/21/05, page 3) Applicants respectfully disagree with the rejection.

Umeda teaches a flame retardative polycarbonate resin composition which comprises 100 parts by weight of an aromatic polycarbonate resin (A), 0.01 to 0.5 part by

weight of an alkali/or alkaline-earth metal salt of a perfluoroalkanesulfonic acid (B), 0.03 to 5 parts by weight of an organopolysiloxane containing organoxysilyl group bonded to a silicon atom through a divalent hydrocarbon group (C), and optionally 5 to 120 parts by weight of an inorganic filler. (see Abstract) The organopolysiloxanes disclosed by Umeda are required to have an organoxysilyl group as shown in formulas VII and VIII (Col. 7, lines 20 – 36).

Umeda teaches that the resin composition can be prepared by compounding components (A), (B) and (C) and kneading the resulting compound. (Col. 11, lines 33 – 38) More specifically, Umeda does not teach first manufacturing a pelletized concentrate that comprises a flame retardant salt and a polycarbonate. For this reason at least, Umeda does not teach all elements of the claimed invention.

Rosenquist teaches manufacturing a fire resistant polycarbonate composition by incorporating into polycarbonate, a fire retardant component containing a perfluoroalkane sulfonate and a cyclic siloxane. (see Abstract) Rosenquist discloses that in order to use polycarbonates in many applications, it is necessary to include additives which retard the flammability of the material and/or which reduce dripping. (Col. 1, lines 11 – 14) Rosenquist, like Umeda, does not teach first manufacturing a pelletized concentrate that comprises a flame retardant salt and a polycarbonate. Rosenquist therefore does not make up for the deficiency of Umeda.

Additionally, Rosenquist cannot be combined with Umeda in the manner made by the Examiner. In the first instance, there is no motivation to combine Rosenquist with Umeda since the organopolysiloxanes of Umeda require the presence of an organoxysilyl group, while the cyclic siloxanes disclosed by Rosenquist do not contain such organoxysilyl groups. The exemplary cyclic siloxanes disclosed by Rosenquist in Col. 2, lines 38 – 61 does not contain organoxysilyl groups. Similarly, Rosenquist's examples in Col. 3 through Col. 5, use octaphenylcyclotetrasiloxane as the cyclic siloxane. Octaphenylcyclotetrasiloxane too does not contain an organoxysilyl group. Thus one of ordinary skill in the art upon reading Umeda would not have combined it with Rosenquist in the manner made by the Examiner.

Mark teaches a plasticized polycarbonate composition comprising high molecular weight aromatic carbonate polymer and a minor amount of a cyclic siloxane plasticizer

(See Abstract). Mark, like Umeda and Rosenquist, does not teach first manufacturing a pelletized concentrate. Mark therefore does not make up for the deficiencies of Umeda or Rosenquist.

Additionally, Mark does not teach fire retardant compositions that contain flame retardant salts and therefore does not provide any motivation for one of ordinary skill in the art to combine it with Umeda. To the contrary, one of ordinary skill in the art desirous of manufacturing a flame retardant composition would be demotivated from combining Mark with Umeda, since Mark does not even teach or disclose flame retardancy or haze reduction.

Further, since Mark like Rosenquist, does not teach cyclic siloxanes that contain organoxysilyl groups, one of ordinary skill in the art upon reading Umeda would find no motivation to substitute the cyclic siloxanes of Umeda with those disclosed by Mark.

Ogoe '280 teaches a carbonate polymer composition comprising a carbonate polymer, a low volatility aromatic phosphate ester compound, and optionally an alkali metal salt having a pH of at least 7 (see Abstract). In the first instance, Ogoe '280 does not teach or disclose the use of cyclic siloxanes.

While Ogoe '280 in Col. 18, line 66 does disclose masterbatching (i.e., manufacturing a concentrate), the additive masterbatch disclosed by Ogoe '280 is not the same as the concentrate presently claimed. For example, Ogoe '280 teaches adding a phosphate ester and an alkali metal salt to a carbonate polymer to form the additive masterbatch. (Col. 18, line 66 – Col. 19, line 5) The additive masterbatch together with the UV stabilizer, antioxidant, epoxidized soybean oil are combined with linear polycarbonate and pelletized in an extruder. (Col. 19, lines 6 – 67). Thus, the additive masterbatch disclosed by Ogoe '280 is a granular mixture that has not been blended and pelletized as is presently claimed. After pelletization, Ogoe '280 does not teach or disclose any additional blending. In other words, Ogoe '280 does not teach a “let down” step, i.e., the masterbatch disclosed in Ogoe '280 is not further blended with additional polycarbonate (i.e., the second polycarbonate).

The claimed invention in contrast is directed to first blending the flame retardant salt with polycarbonate to make a pelletized concentrate and subsequently blending the pelletized concentrate with additional polycarbonate (i.e., the second polycarbonate) and

a cyclic siloxane to manufacture the fire resistant polycarbonate. Thus, Ogoe '280 too does not teach all elements of the claimed invention. As a result, combining Ogoe '280 with Umeda, Mark and Rosenquist would still not produce the claimed invention.

Further, Ogoe '280 teaches that the objective of its invention is to produce a carbonate polymer having a UL-94 V-2 performance level. (Col. 4, lines 3 – 4) Ogoe '280 further teaches that in order to obtain a UL-94 V-2 rating, the addition of an aromatic phosphate ester compound to the polycarbonate will promote sufficient dripping to remove the burning polymer from the part being tested thereby achieving the desired UL-94 V-2 rating. (Col. 4, lines 54 – 60)

In the first instance, it is submitted that there is no motivation to combine Ogoe '280 with Rosenquist since the teachings of Ogoe '280 are in direct contradiction to those of Rosenquist. As noted earlier, Rosenquist teaches a flame retardant polycarbonate composition, where dripping during a flame retardancy test is to be reduced. Ogoe '280 on the other hand teaches a composition containing an aromatic phosphate ester in an amount effective to facilitate dripping during a flame retardancy test. (Col. 4, lines 54 – 60) One of ordinary skill in the art upon reading Rosenquist would not attempt to combine it with Ogoe '280, since the teachings of these respective references are mutually exclusive. The Applicants also contend that the combination of Ogoe '280 with Umeda, Mark and Rosenquist was made in hindsight using the present invention as a template.

Ogoe '479 discloses making a concentrate by pelletizing a carbonate polymer comprising one or more additives selected from the group consisting of a metal salt, a halogenated aromatic compound, a metal salt of an inorganic compound, a free aromatic sulfimide and a fibril forming polytetrafluoroethylene (see Claim 1). The Examples of Ogoe '479 teach manufacturing a concentrate comprising all of the additives and the polycarbonate in a single step. (see Examples 1 – 3 in Col. 3, line 64 to Col. 4, line 50) The concentrate is then let down with only the base polycarbonate resin. Ogoe '479 states that "[t]he improvement of Izod impact via the use of IR concentrate is attributed to more uniform dispersion using IR concentrate than using IR masterbatch". (Col. 5, lines 32 – 35) The Examiner has cited this as motivation for using a concentrate. (Office Action dated 07/27/04, page 4)

The Applicants would like to direct the Appeal Board's attention to the attached Declaration (attached as Appendix B), which in turn references two earlier declarations – Declaration A and Declaration B submitted in support of the invention in the parent application i.e., U.S. Application Serial No. 09/749,645 filed on December 27, 2000, now U.S. Patent No. 6,730,720. In Declaration A (attached as Appendix C) and Declaration B (attached as Appendix D), a fire resistant polycarbonate comprising polycarbonate, the flame retardant potassium salt of perfluoro butane sulfonate (KPFBS) and a cyclic siloxane was tested for impact resistance as well as for other relevant properties. The fire resistant polycarbonate in the respective Declaration's A and B was manufactured in the manner claimed in the present application. While the fire retardant salt in the Declarations A and B is the potassium salt of perfluoro butane sulfonate (KPFBS), it is submitted that since this salt belongs to the same family as the fire retardant salts claimed in Claim 1 and Claim 21 they would behave in a manner similar to the potassium salt of perfluoro butane sulfonate (KPFBS). The attached declaration (Appendix B) attests to this.

In Declaration A, Table 1 shows the impact properties for a fire resistant polycarbonate comprising polycarbonate, potassium salt of perfluorobutane sulfonate and cyclic siloxane. Sample 6 in Table 2 shows impact properties for a polycarbonate that does not contain any flame retardant salt. Similarly, Table 1 of Declaration B also shows impact properties. From Tables 1 and 2 of Declaration A as well as Table 1 of Declaration B, it may be seen that there is no statistical difference between the impact properties of a polycarbonate sample that does not contain the flame retardant salt (sample 6 in Table 2) and polycarbonate samples that contain various levels of the salt. Since the impact resistance does not vary with salt content, it can be clearly seen that the use of a concentrate does not improve the impact properties of the polycarbonate sample as maintained by the Examiner. It is further submitted that this lack of an improvement in the impact properties reflects that there is no improvement in dispersion as the result of using a concentrate. Even if there was an improvement in dispersion, it does not appear to manifest itself in measured mechanical properties and the improvement in the haze is solely the result of synergy between the cyclic siloxane and the fire retardant salt. Thus there is no motivation to combine Ogoe '479 with either Umeda, Rosenquist or Mark,

since the use of a masterbatch does not improve the impact properties or the dispersion as claimed by the Examiner.

In addition, the Examiner has stated that “adding a cyclic siloxane to the compositions of Ogoe ‘479 and Ogoe ‘280 would reduce the melt viscosity of the polymer and facilitate better dispersion of the additives”. (Office Action dated 07/27/04, page 4) However, Rosenquist proves that this is inaccurate. A review of Tables 1A, 1B, 1C, 1D, 2A and 2B in Rosenquist clearly shows that this increasing amount of the cyclic siloxane does not always reduce viscosity. For example, Column 5 of Table 1C shows a composition that contains 0.07 wt% of KPFBS and 0.05 wt% of cyclic siloxane while Column 1 of Table 1D shows a composition that contains 0.07 wt% of KPFBS and 0.1 wt% of cyclic siloxane. The melt flow of both compositions is 15.8. Similarly, Column 7 of Table 2A shows a composition that contains 0.09 wt% of KPFBS and 0.05 wt% of cyclic siloxane while Column 3 of Table 2B shows a composition that contains 0.09 wt% of KPFBS and 0.1 wt% of cyclic siloxane. Here, the composition containing the larger amount of siloxane has a higher viscosity thereby disproving the Examiner’s contention. Thus the Examiner’s contention that the cyclic siloxane reduces the viscosity is incorrect.

While there is no decrease in viscosity with increasing cyclic siloxane content, there is a detrimental decrease in the heat distortion temperature as is detailed below. From Table 1 of Declaration B it may further be seen that there is a decrease in the heat distortion temperature (HDT) test and the softening temperature derived from the Vicat test. Such a reduction in softening temperature is detrimental to a flame retardant composition since it is generally desirable to have deformation occur at as high a temperature possible when heated or subjected to a flame. Thus from the above data, it is quite clear that the addition of the cyclic siloxane to the flame retardant polycarbonate composition containing a flame retardant salt does not improve the impact properties or the dispersion, but instead causes a decrease in the softening temperature of the composition which is generally undesirable. Thus once again, there is no motivation to combine Ogoe ‘479 with Umeda, Rosenquist or Mark, since there is no advantageous change in viscosity to facilitate an improved dispersion, but rather there is a detrimental effect on the high temperature properties of the fire retardant polycarbonate composition.

The Applicants contend that the Examiner has combined Umeda, Mark, Rosenquist and Ogoe '479 only as a result of hindsight provided by the claims of the present application. In this regard the courts have stated that "[t]he references, when viewed by themselves and not in retrospect, must suggest the invention". *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975). Applicants further maintain that the Examiner has improperly used Applicants disclosure to select portions of the cited references to allegedly arrive at Applicants invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicants invention as a whole in contravention of §103, including the disclosures of the references that teach away from Applicants invention.

Lastly, the Examiner has stated that the Declarations of Dr. Singh have no probative value since they do not compare the masterbatched composition against the non-masterbatched composition.

In the first instance, the Declarations of Dr. Singh did not have to compare the results from the masterbatched composition with those of the non-masterbatched composition, since such a comparison was already made in the Examples of the present application. A review of the Examples on pages 9 through 13 clearly indicate that comparative samples 1 and 3 which did not contain the masterbatch have inferior haze and Yellowness Index (YI) when compared with samples 2 and 4 that were manufactured as a result of masterbatching. The Declarations of Dr. Singh were made to disavow the Examiner of his notions that there was motivation to combine the references because of certain statements that were made in the references. The Declarations showed that the Examiner's presumed reasons for claiming motivation was not indeed accurate.

In conclusion, since Umeda, Rosenquist and Mark do not teach all of the claimed elements and since there is no motivation to combine the aforementioned references with Ogoe '280 and Ogoe '479, the Applicants contend that the Examiner has not made a prima facie case of obviousness over Umeda, Rosenquist, Mark, Ogoe '479 or Ogoe '280. Additionally, since the KPFBS belongs to the same family of fire retardant salts as those claimed in the present application, Applicants believe that they should behave in the same manner.

Thus the Examiner's rejections of Claims 1 – 9 and 21- 29 should be reversed and Claims 1 – 9 and 21- 29 should be allowed.

IX. CLAIMS APPENDIX

APPENDIX A

1. (Previously Presented) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of potassium perfluoromethylbutane sulphonate, potassium perfluoromethane sulphonate, potassium perfluoroethane sulphonate, potassium perfluoropropane sulphonate, potassium perfluorohexane sulphonate, potassium perfluoroheptane sulphonate, potassium perfluorooctane sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts;

pelletizing the concentrate; and,

blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

2. (Original) The method of Claim 1, wherein the flame retardant salt is present in the concentrate in an amount from about 0.10 to about 5.0 weight percent based upon the total weight of the concentrate.

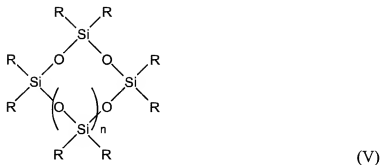
3. (Original) The method of Claim 1, wherein the first polycarbonate is the same as the second polycarbonate.

4. (Original) The method of Claim 1, wherein the flame retardant salt is present in the fire resistant polycarbonate composition in amounts of about 0.01 to about 1.0 weight percent based upon the total weight of the polycarbonate.

5. (Previously Presented) The method of Claim 1, further comprising blending with the concentrate and the second polycarbonate, a filler, a reinforcing agent, a heat stabilizer, an antioxidant, a light stabilizer, a plasticizer, an antistatic agent, a mold releasing agent, an additional resin, a blowing agent or combinations comprising at least one of the foregoing.

6. (Previously Presented) The method of Claim 1, wherein the cyclic siloxane is present in the flame resistant polycarbonate composition in an amount from about 0.01 to about 0.5 parts per hundred parts by weight of the first polycarbonate and the second polycarbonate.

7. (Original) The method of Claim 1, wherein the cyclic siloxane has the general formula (V)



wherein n is 0–7 and each R is independently an alkyl group having from 1 to about 36 carbons, an alkoxy group having from 1 to about 36 carbons, a fluorinated or perfluorinated alkyl or alkoxy group having from 1 to about 36 carbons, an arylalkoxy group having from 7 to about 36 carbons, an aryl group having from 6 to about 14 carbons, an aryloxy group having from 6 to about 14 carbons, a fluorinated or perfluorinated aryl group having from 6 to about 14 carbons, or an alkylaryl group having from 7 to about 36 carbons.

8. (Original) The method of Claim 1, wherein the cyclic siloxane is octaphenylcyclotetrasiloxane, hexamethylcyclotrisiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, trimethyltriphenylcyclotrisiloxane, or tetramethyltetraphenylcyclotetrasiloxane.

9. (Original) The method of Claim 1, wherein the cyclic siloxane comprises octaphenylcyclotetrasiloxane.

10. (Original) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt comprises a C₁-C₆ alkylammonium salt;

pelletizing the concentrate; and,

blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

11. (Previously Presented) The method of Claim 10, wherein the flame retardant salt is selected from the group consisting of tetrabutyl ammonium perfluoromethylbutane sulphonate, tetrabutyl ammonium perfluoromethane sulphonate, tetrabutyl ammonium perfluoroethane sulphonate, tetrabutyl ammonium perfluoropropane sulphonate, tetrabutyl ammonium perfluorohexane sulphonate, tetrabutyl ammonium perfluoroheptane sulphonate, tetrabutyl ammonium perfluorooctane sulphonate, tetrabutyl ammonium perfluorobutane sulphonate, tetrabutyl ammonium diphenylsulfone sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts.

12. (Previously Presented) The method of Claim 10, wherein the flame retardant salt is selected from the group consisting of tetraethyl ammonium perfluoromethylbutane sulphonate, tetraethyl ammonium perfluoromethane sulphonate, tetraethyl ammonium perfluoroethane sulphonate, tetraethyl ammonium perfluoropropane sulphonate, tetraethyl ammonium perfluorohexane sulphonate, tetraethyl ammonium perfluoroheptane sulphonate, tetraethyl ammonium perfluorooctane sulphonate, tetraethyl ammonium perfluorobutane sulphonate, tetraethyl ammonium diphenylsulfone sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts.

13. (Original) The method of Claim 10, wherein the flame retardant salt is present in the concentrate in an amount from about 0.10 to about 5.0 weight percent based upon the total weight of the concentrate.

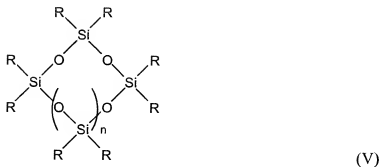
14. (Original) The method of Claim 10, wherein the first polycarbonate is the same as the second polycarbonate.

15. (Original) The method of Claim 10, wherein the flame retardant salt is present in the fire resistant polycarbonate composition in amounts of about 0.01 to about 1.0 weight percent based upon the total weight of the polycarbonate.

16. (Previously Presented) The method of Claim 10, further comprising blending with the concentrate and the second polycarbonate, a filler, a reinforcing agent, a heat stabilizer, an antioxidant, a light stabilizer, a plasticizer, an antistatic agent, a mold releasing agent, an additional resin, a blowing agent or combinations comprising at least one of the foregoing.

17. (Previously Presented) The method of Claim 10, wherein the cyclic siloxane is present in the flame resistant polycarbonate composition in an amount from about 0.01 to about 0.5 parts per hundred parts by weight of the first polycarbonate and the second polycarbonate.

18. (Original) The method of Claim 10, wherein the cyclic siloxane has the general formula (V)



wherein n is 0–7 and each R is independently an alkyl group having from 1 to about 36 carbons, an alkoxy group having from 1 to about 36 carbons, a fluorinated or perfluorinated alkyl or alkoxy group having from 1 to about 36 carbons, an arylalkoxy group having from 7 to about 36 carbons, an aryl group having from 6 to about 14 carbons, an aryloxy group having from 6 to about 14 carbons, a fluorinated or perfluorinated aryl group having from 6 to about 14 carbons, or an alkylaryl group having from 7 to about 36 carbons.

19. (Original) The method of Claim 10, wherein the cyclic siloxane is octaphenylcyclotetrasiloxane, hexamethylcyclotrisiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, trimethyltriphenylcyclotrisiloxane, or tetramethyltetraphenylcyclotetrasiloxane.

20. (Original) The method of Claim 10, wherein the cyclic siloxane comprises octaphenylcyclotetrasiloxane.

21. (Previously Presented) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of sodium perfluoromethylbutane sulphonate, sodium perfluoromethane sulphonate, sodium perfluoroethane sulphonate, sodium perfluoropropane sulphonate, sodium perfluorohexane sulphonate, sodium perfluoroheptane sulphonate, sodium perfluorooctane sulphonate, sodium perfluorobutane sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts;

pelletizing the concentrate; and,

blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

22. (Original) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending flame retardant salt with a first polycarbonate to produce a concentrate,

pelletizing the concentrate; and

blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition;

wherein a 4.5 mm thick chip formed from the fire resistant polycarbonate has a percent haze of 0.51 to 1.23.

23. (Previously Presented) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of potassium diphenylsulphone sulphonate, sodium diphenylsulphone sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts;

pelletizing the concentrate; and,

blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

24. (Previously Presented) A method for reducing haze in fire resistant polycarbonate compositions, comprising:

blending a flame retardant salt with a first polycarbonate to form a concentrate;
and

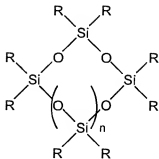
blending the concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

25. (Previously Presented) The method of Claim 24, wherein the first polycarbonate is the same as the second polycarbonate.

26. (Previously Presented) The method of Claim 24, wherein the flame retardant salt is present in the fire resistant polycarbonate composition in amounts of about 0.01 to about 1.0 weight percent based upon the total weight of the first polycarbonate and the second polycarbonate.

27. (Previously Presented) The method of Claim 24, wherein the cyclic siloxane is present in the flame resistant polycarbonate composition in an amount from about 0.01 to about 0.5 parts per hundred parts by weight of the first polycarbonate and the second polycarbonate.

28. (Previously Presented) The method of Claim 24, wherein the cyclic siloxane has the general formula (V)



(V)

wherein n is 0–7 and each R is independently an alkyl group having from 1 to about 36 carbons, an alkoxy group having from 1 to about 36 carbons, a fluorinated or perfluorinated alkyl or alkoxy group having from 1 to about 36 carbons, an arylalkoxy group having from 7 to about 36 carbons, an aryl group having from 6 to about 14 carbons, an aryloxy group having from 6 to about 14 carbons, a fluorinated or perfluorinated aryl group having from 6 to about 14 carbons, or an alkylaryl group having from 7 to about 36 carbons.

29. (Previously Presented) The method of Claim 24, wherein the flame retardant salt is selected from the group consisting of potassium perfluoromethylbutane sulphonate, potassium perfluoromethane sulphonate, potassium perfluoroethane sulphonate, potassium perfluoropropane sulphonate, potassium perfluorohexane sulphonate, potassium perfluoroheptane sulphonate, potassium perfluorooctane sulphonate, sodium perfluoromethylbutane sulphonate, sodium perfluoromethane sulphonate, sodium perfluoroethane sulphonate, sodium perfluoropropane sulphonate, sodium perfluorohexane sulphonate, sodium perfluoroheptane sulphonate, sodium perfluorooctane sulphonate, sodium perfluorobutane sulphonate, tetraethyl ammonium perfluoromethylbutane sulphonate, tetraethyl ammonium perfluoromethane sulphonate, tetraethyl ammonium perfluoroethane sulphonate, tetraethyl ammonium perfluoropropane sulphonate, tetraethyl ammonium perfluorohexane sulphonate, tetraethyl ammonium perfluoroheptane sulphonate, tetraethyl ammonium perfluorooctane sulphonate, tetraethyl ammonium perfluorobutane sulphonate, tetraethyl ammonium diphenylsulfone sulphonate, tetrabutyl ammonium perfluoromethylbutane sulphonate, tetrabutyl ammonium perfluoromethane sulphonate, tetrabutyl ammonium perfluoroethane sulphonate, tetrabutyl ammonium perfluoropropane sulphonate, tetrabutyl ammonium perfluorohexane sulphonate, tetrabutyl ammonium perfluoroheptane sulphonate, tetrabutyl ammonium perfluorooctane sulphonate, tetrabutyl ammonium perfluorobutane sulphonate, tetrabutyl ammonium diphenylsulfone sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts.

X. EVIDENCE APPENDIX

Three declarations (attached hereto as Appendix B, C and D respectively) are submitted pursuant to section 1.132 of this title in connection with this appeal brief.

XI. RELATED PROCEEDINGS APPENDIX

There have been no related proceedings in connection with this appeal brief. As a result there are no decisions rendered by a court or the Board pursuant to paragraph (c)(1)(ii) of this section.

XII. CONCLUSION

In summary, Claims 1- 9 and 21 - 29 are non-obvious over the art of record. For the reasons cited above, Appellants respectfully submit that all of the claims are allowable and the application is in condition for allowance. Appellants respectfully request reversal of the outstanding rejections and allowance of this application.

In the event the Examiner has any queries regarding the submitted arguments, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are any additional charges with respect to this Appeal Brief, please charge them to Deposit Account No. 07-0893.

Respectfully submitted,

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